Introduction to Computer Science

Dr. Jian-Ren Hou

National Cheng Kung University

First Thing First

- **無法全部加簽**
  - ×課程上限
  - ×優先權
  - ×待系辦提供名單

Dr. Jian-Ren (Jeff) Hou (侯建任)

Office: 61326

E-mail: JeffHou@gs.ncku.edu.tw

Office Hours: By Appointment

About the Course (1/3)

- Computer Concept
- Basic Programming Language
  - C++

About the Course (2/3)

- Also recommend
  - Python (self-study)

About the Course (3/3)

◊ Lecture

◊Textbook-

1. Campbell, J. T., (2023). Discovering Computers: Digital Technology, Data, and Devices (Asia/17 Ed.). Cengage Learning. 華泰文化代理
2. Deitel & Deitel, C++ How to Program: Late Objects Version, 7th ed.

◊ In-class Exercise

Why C++ and Python?

◊ Comparison

	Python	C++
Speed	Relatively Slow	Fast
Syntax	Easier	A little Harder
Compile	Interpreter	Pre-compiled
Variable	Dynamically	Statically
Where?	Machine learning; Data Science; Web	Application; Game
And others	…	…

Most Popular Programming Language

TIOBE Index

Jun 2022	Jun 2021	Change	Programming language	Ratings	Change
1	2	↑	Python	12.20%	+0.35%
2	1	↓	C	11.91%	-0.64%
3	3		Java	10.47%	-1.07%
4	4		C++	9.63%	+2.26%
5	5		C#	6.12%	+1.79%
6	6		Visual Basic	5.42%	+1.40%
7	7		JavaScript	2.09%	-0.24%
8	10	↑	SQL	1.94%	+0.06%
9	9		Assembly language	1.85%	-0.21%
10	16	↑↑	Swift	1.55%	+0.44%
11	11		Classic Visual Basic	1.33%	-0.40%
12	18	↑↑	Delphi/Object Pascal	1.32%	+0.26%
13	8	↓↓	PHP	1.25%	-0.97%

PYPL Index (Worldwide)

Jun 2022	Change	Programming language	Share	Trends
1		Python	27.61 %	-2.8 %
2		Java	17.64 %	-0.7 %
3		JavaScript	9.21 %	+0.4 %
4		C#	7.79 %	+0.8 %
5		C/C++	7.01 %	+0.4 %
6		PHP	5.27 %	-1.0 %
7		R	4.26 %	+0.5 %
8	↑↑↑	TypeScript	2.43 %	+0.7 %
9	↓	Objective-C	2.21 %	+0.1 %
10	↓	Swift	2.17 %	+0.4 %
11	↑↑	Matlab	1.71 %	+0.2 %
12	↓↓	Kotlin	1.57 %	-0.2 %
13	↓	Go	1.48 %	+0.0 %

- Source: https://statisticstimes.com/tech/top-computer-languages.php

Most Popular Programming Language (2021)

TIOBE Index

Aug 2021	Aug 2020	Change	Programming language	Ratings	Change
1	1		C	12.57%	-4.41%
2	3	↑	Python	11.86%	+2.17%
3	2	↓	Java	10.43%	-4.00%
4	4		C++	7.36%	+0.52%
5	5		C#	5.14%	+0.46%
6	6		Visual Basic	4.67%	+0.01%
7	7		JavaScript	2.95%	+0.07%
8	9	↑	PHP	2.19%	-0.05%
9	14	↑↑	Assembly language	2.03%	+0.99%
10	10		SQL	1.47%	+0.02%
11	18	↑↑	Groovy	1.36%	+0.59%
12	17	↑↑	Classic Visual Basic	1.23%	+0.41%
13	42	↑↑	Fortran	1.14%	+0.83%
14	8	↓↓	R	1.05%	-1.75%
15	15		Ruby	1.01%	-0.03%

PYPL Index (Worldwide)

Aug 2021	Change	Programming language	Share	Trends
1		Python	29.93 %	-2.2 %
2		Java	17.78 %	+1.2 %
3		JavaScript	8.79 %	+0.6 %
4		C#	6.73 %	+0.2 %
5	↑	C/C++	6.45 %	+0.7 %
6	↓	PHP	5.76 %	-0.0 %
7		R	3.92 %	-0.1 %
8		Objective-C	2.26 %	-0.3 %
9	↑	TypeScript	2.11 %	+0.2 %
10	↓	Swift	1.96 %	-0.3 %
11	↑	Kotlin	1.81 %	+0.3 %
12	↓	Matlab	1.48 %	-0.4 %
13		Go	1.29 %	-0.2 %
14	↑↑	Rust	1.21 %	+0.2 %
15	↓	VBA	1.16 %	-0.1 %

- Source: https://statisticstimes.com/tech/top-computer-languages.php

One Requirement

Or I will need to force you to.

Another Requirement

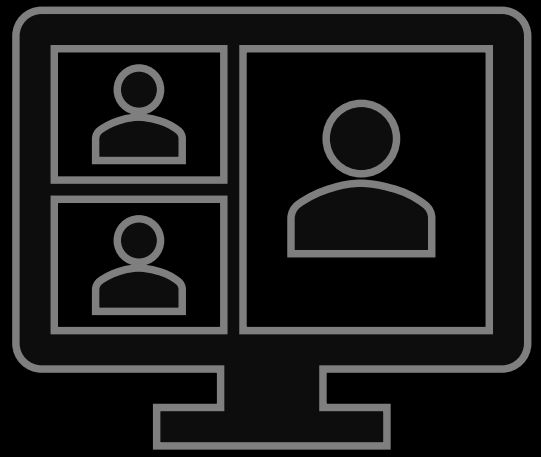
Hardware Preparation (Online, unlikely)

- ◊WebCam
- ◊Microphone
- ◊Earphone (optional)

- ■You will be called anytime during my class.
- ■If you fail to response me
  - ■Losing your participation points

Hardware (Offline)

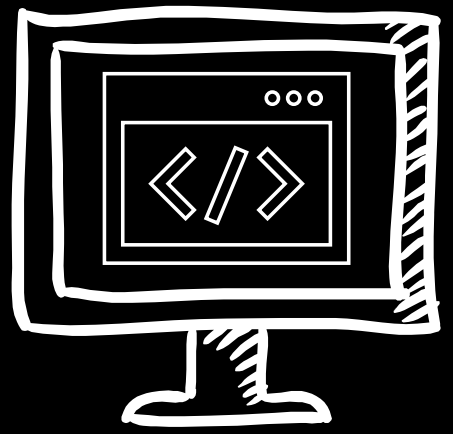
- Recommended
  - Laptop (fully juiced)
    - Or
  - Tablet with keyboard
    - Or
  - Team up with your friend



Course plan

- Tue
  - Intro to Computer Science

- Wed
  - Programming



Grading Policy

Participation	10%
Exercise	10%
Midterm Exam	25%
Final Project	30%
Final Exam	25%

Participation -10%

- Roll call (Yes, I do the roll call.)
  - Sing-in Sheet
  - Screenshot from MS team (if online)
- You opinion matters

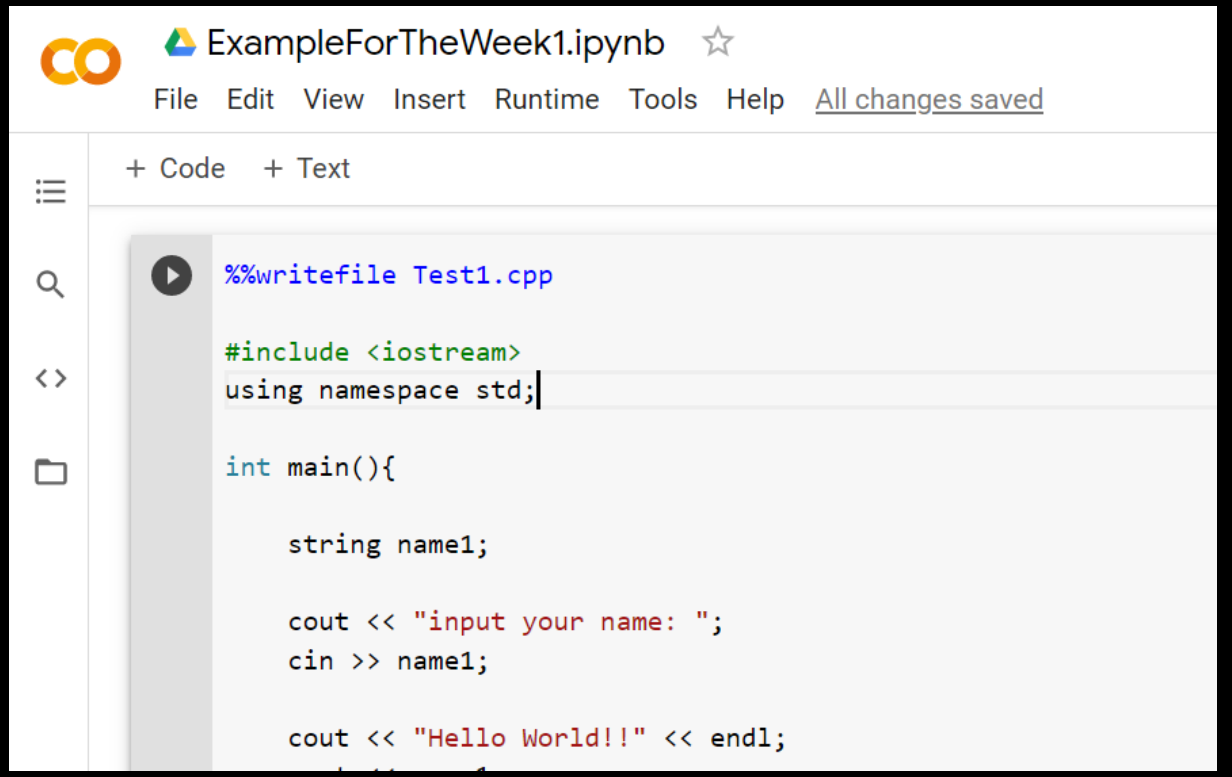
Exercise -10%

- In-class exercise
  - Done by
    - Google Colab (Actually just Jupyter Notebook on the cloud) or
    - Local Jupyter Notebook
- Weekly Exercise
  - One simple task each week
  - Feel free to Google (No Copy and Paste)
  - TA class

Google Colab

◊Use your NCKU Google Suite Account to activate

■Google Colab



Jupyter notebook

- If you prefer work locally
- Search, download and, install
  - Anaconda
  - mingw
    - mingw32 gcc g++

Exercise -10%

- Zero tolerance for plagiarism
  - You will receive a zero
  - You should be able to finish it by yourself in TA classes.

Midterm Exam -25%

- In-person
- Seating plan will be announced before the exam
- MCQ question + Short answer

Final Exam -30%

× In-person

× Seating plan will be announced before the exam

×Comprehensive

×MCQ question + Short answer

Final Project -25%

- Team up
  - Choose your teammate carefully
- Using the program your write to compete
  - Ex: 1A2B
- Team size – TBD (9/26)
- Register your team
  - E-mail to TAs
  - Before the midterm

Feedback

- Open to any opinion to improve the class
- Let me know

To-Do list

- [x] Team Formation (Final Projects)
  - Before the midterm
  - n members in a team

Game Plan

- The instructor reserves the right to adjust the content and schedule in any way that serves the educational needs of the students enrolled in this course.

Week	Description
1	Class introduction- Basic computer concepts and basic C++
2	Introduction to C++ Programming; Being a Digital Citizen
3	Control Statements; The Internet
4	Control Statements; Evaluating Hardware
5	Control Statements; Evaluating Hardware (mini project)
6	Function; Evaluating Hardware (mini project)
7	Function; Programs and Apps
8	Function; Digital Security, Ethics, and Privacy
9	Midterm Exam
10	Recursion; Input and Output
11	Arrays and Vectors; Digital Storage
12	Arrays and Vectors; Operating Systems
13	Arrays and Vectors; Networks and Network Devices
14	Pointer; Databases
15	Pointer; Technology Careers
16	Final Projects
17	Final Projects
18	Final Exam

☺ TA

- 陳俞君
  R36124104@gs.ncku.edu.tw
- And Many Others

Any Question ?